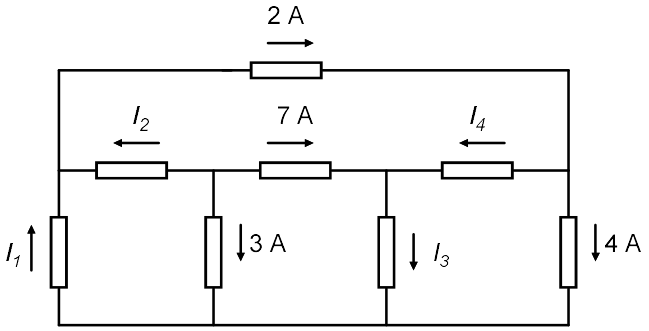
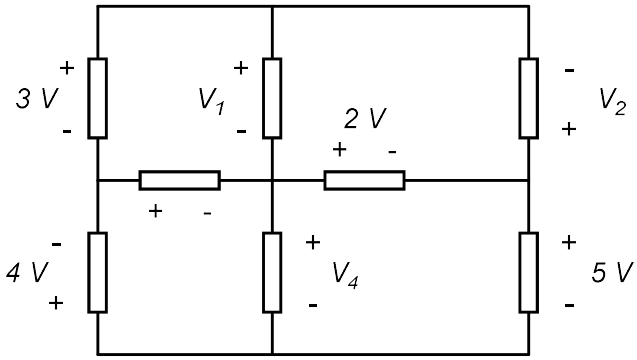
ESC201AT: Introduction to Electronics

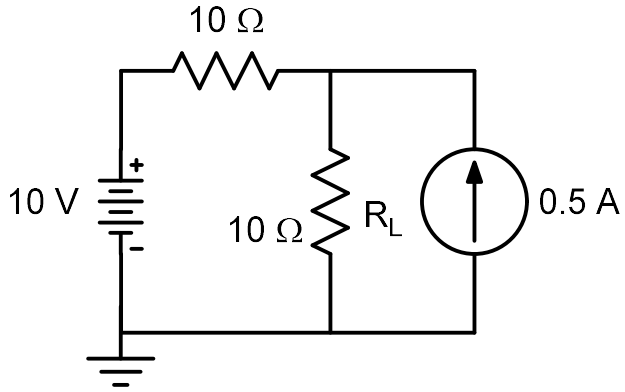
HW -1 **Date: 1.9.2020**

Q.1 Apply KCL and KVL respectively to circuits shown below to find currents and voltages.



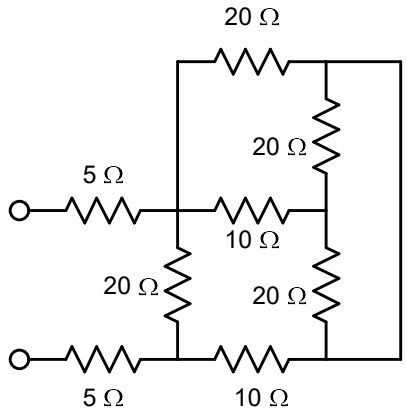


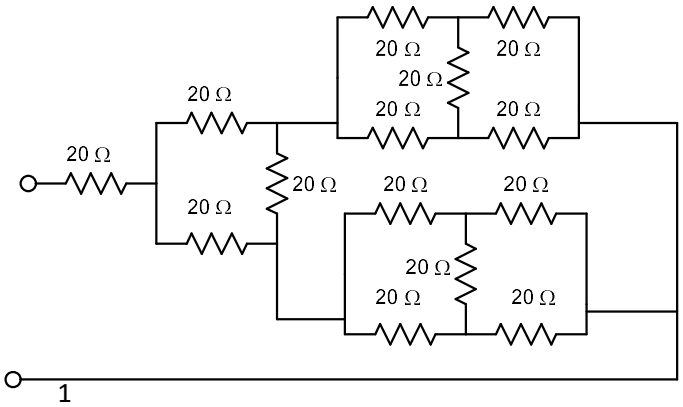
Q.2 Calculate the power supplied or absorbed by each element.



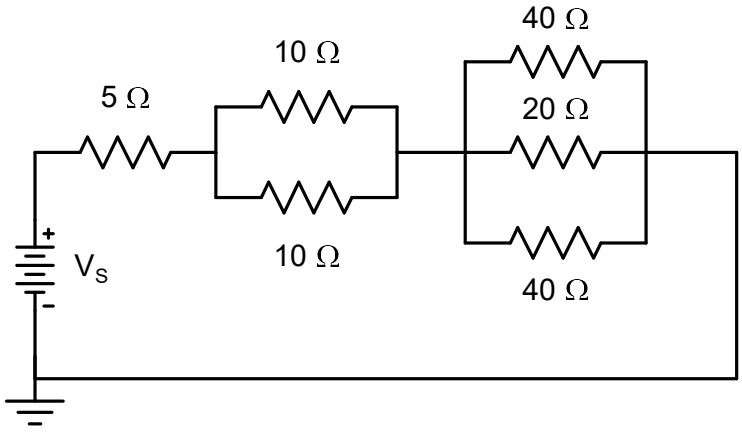
Q. 3 Suggest one single change in the circuit above that would make the power dissipated in the load resistor (which is fixed at 10 ohms) four times larger.

Q.4 Determine the equivalent resistance for the circuits shown below





Q.5 Determine the value of V_S such that current in the 20 ohms load resistor is 1A for the circuit shown below.



Q.6 For the value of V_S computed in Q4, suggest a change in one single resistor that would reduce the current flowing through 20 ohms resistor to 0.5A.

Q.7 For the value of V_S computed in Q4, modify the resistance values in the circuit such that current through the 20 ohms resistor becomes 0.5A while maintaining the same current of 2A drawn from the battery as before.

Q.8 For the value of V_S computed in Q4, determine the maximum and minimum values of the current flowing through the 20 ohms resistor if all resistors (except 20 ohms) have a tolerance of ± 5% (meaning their resistance can decrease or increase by 5% over their nominal stated values)

Q.9 For the value of V_S determined in Q.4, determine the change in current flowing through the 20 ohms resistor if its value can change by ± 5% due to changes in temperature.

Q.10 Determine the expression for the voltage Vo in the Wheatstone Bridge circuit shown below